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ABSTRACT

This document contains three papers from a symposium on on-the-job learning. "Effectiveness of On-the-Job Learning" (Marcel R. van der Klink) presents the results of an empirical investigation demonstrating that on-the-job learning caused only a modest improvement in trainee's sales behavior but this improvement was maintained over a considerable length of time. "Finding Their Own Way: Informal Learning and Public School Teachers" (Margaret C. Lohman, Nicholas H. Woolf) focuses on a study that interviewed 18 teachers to examine the informal ways that public school teachers develop professional expertise. Data analysis shows teachers performed three roles during informal learning: knowledge exchanger, environmental scanner, and discoverer; engagement in these roles is influenced by organizational characteristics such as classroom location, allocation of resources, school policies, evaluation processes, and reward systems. "Learning from Experience: The Professional Practical Knowledge of Female Leaders in HRD" (Ruth Schmidle Lavin) explores the workplace experiences of three female human resource development (HRD) professionals and finds that each leader's practical knowledge was structurally composed of three dimensions that had been developed into a coherent system. (YLB)

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ED 428 256

35 **On-the-Job Learning**

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Effectiveness of On-the-Job Training

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Finding Their Own Way: Informal Learning and Public School Teachers

Margaret C. Lohman, University of Iowa

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Learning from Experience: The Professional Practical Knowledge of Female Leaders in HRD

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ACADEMY OF
HUMAN RESOURCE DEVELOPMENT

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CE 077 290

Effectiveness of on-the-job training

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OJT is perceived as an effective training method. Remarkably there is barely empirical evidence to support this perception. In this paper the focus is on an empirical investigation of the effectiveness of OJT. The results of the study show that the OJT only establish a modest improvement in trainee's sales behavior but this improvement is maintained over a considerable length of time.

Since previous decennium increasing attention is paid to on-the-job training (OJT). In the Netherlands, for example OJT is applied in 12,5% of the companies. It is used most frequently in banking and assurance companies. Various motives are accountable for this growing attention. It is assumed that OJT reduces the transfer problem because the training setting and the work environment are identical which enhances the long term transfer (Jacobs & Jones, 1995). Last years HRD departments experience a constant pressure to invest training dollars as effective as possible. This contributes to the increasing use of OJT in stead of more expensive off-the-job training programs (Rothwell, 1991). An other explanation for the current attention for OJT points at the concept of the learning organization (Jacobs, 1992). OJT fits reasonably well into this concept. The learning organization as a concept emphasises managers' responsibility for creating training opportunities within their department and also stresses the close link between working and learning, which is established in OJT.

Problem statement

Research into the domain of OJT is scare. This conclusion is especially valid for research that pay attention to the effectiveness of OJT. Only a few studies were discovered wherein the focus is on the effectiveness of OJT. In the work of Jacobs the financial benefits of OJT is the key issue (Jacobs & McGiffin, 1987; Jacobs, Jones & Neil, 1992; Jacobs & Hruby, 1996). In two of the three aforementioned studies the financial benefits of OJT exceeded the financial costs for the design and delivery of OJT. Typical for the research of Jacobs and co-authors is that they include only small numbers of trainees and a limited number of variables in their studies. Therefore, these studies provide no profound insight in the (training design) variables which predict the effectiveness of OJT. A study that shed more light on the effectiveness of OJT was carried out by Wexley (1988). In this study pairs of trainees and their trainers were involved. The major finding of Wexley concerns the relationship between trainer and trainee. A sound relationship has a positive impact on the improvement of trainee's behavior.
The conclusion that can be drawn is that in the field of HRD OJT is perceived as an effective training method, while research underpinning this perception is rather scarce. The lack of empirical evidence for the effectiveness of OJT was the starting point for the research project that is described in this paper.

Theoretical framework

The relationship between OJT and effectiveness was explored by reviewing literature on the transfer

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of training. A comprehensive overview is presented in an earlier paper on this subject (see Van der Klink & Streumer, 1997). With regard to the transfer of training evidence was found for the influence of the work environment on the transfer of training. Especially the role of the trainee's manager seems relevant for establishing long term effects of training (Brinkerhoff & Montesino, 1995; Gielen, 1995; Rouiller & Goldstein, 1993). From all the variables trainee characteristics seem to have the most impact on the transfer of training. Empirical evidence exists for the impact of age (Kubeck et al, 1996), trainees' level of education (Gielen, 1995), self-efficacy (Gielen, 1995), perception of training relevance (Ameel, 1992), job involvement (Brown & Leigh, 1996; Gauthier, 1995).

Research questions and design of the study

This paper focuses on the effectiveness of OJT. Two research questions were central in the study:
1) Is OJT an effective training method?
2) Which variables are linked with the effectiveness of OJT.

Design of the study. As a consequence of organizational constrains a pre-test post-test design was found to be most practicable. To determine the impact of the OJT two measurements after the training were scheduled. The first post-test was immediate after the training (O2) and the second approximately 15 weeks later (O3). These two measurements were preceded by a pre-test (O1) at the start of the OJT. Respondents were the trainees (O1,O2 and O3), their trainers (O1,O2) and trainees' managers (O3)

Setting

Organization. The study was carried out in the largest company for telecommunication products and services in The Netherlands: PTT Telecom. The OJT was delivered to telemarketeers in the call-centers. Their job is to communicate by telephone with customers about all the products and services their company offers. Last years a shift was noticeable in the company's strategy. It is not only the task of telemarketeers to provide information but more emphasis is placed on selling products and services to customers. Therefore, frequently attention is paid to employees' sales behavior. One of the tools managers can use to enhance their employees' sales behavior is the OJT offered by the HRD department of PTT Telecom.

Description of the OJT. The OJT can be characterized as a short individual refreshment training. This means a trainer visits the regional call-center for several days and listens to the communication between the employee and the customer. For this purpose the trainer has an additional phone he can plug in which enables him to have direct access to the communication between the employee and the customer. During and between calls the trainer provides feedback to the trainee. The length of the OJT per trainee varies but seldom exceeds one day. When trainers deliver the OJT in a call-center it is common practice to train all telemarketeers within the call-center.

Instrumentation

Below follows a brief description of the content of the instruments and the data collection procedures.

Effectiveness of the OJT. Effectiveness was operationalized as trainees' sales behavior and organizational benefits (level 3 and 4 of Kirckpatrick's model).
After consultation of trainers, managers, sales experts and available training documents a scale was constructed to measure sales behavior. This scale consisted of 25 items and it covered five topics:

opening the conversation, analyzing customer's needs, offering a product/service, dealing with customer's objections, finishing the sales conversation.

To measure organizational benefits of the OJT it was found to be most practical to use the data that is stored in the management information system. This information is available for call-centers but not for individual trainees. Since all or almost all the employees in a call-center participate in the OJT this is not perceived as troublesome. From the management information system data was used with regard to the monthly sales. This information was received for a time interval of nine months: from three months before to three months after the deliverance of the OJT in the call-centers.

Training characteristics. Two variables were used to measure training characteristics. A scale that consisted of 9 items was used to measure trainee's perception of the quality of the deliverance of the OJT. Also one item was included to measure the length of the OJT.

Work environment characteristics. As the work of Baldwin & Ford (1988) proofs apart from training design characterises also trainee characteristics and work environment characteristics are linked with the effectiveness of training. The role of work environment seems especially relevant for OJT because the work environment serves as the training setting. Six variables were included in the data collection: feedback of manager, feedback of colleagues, support of manager, support of colleagues, workload, and opportunity to use the training content in daily work.

Trainee characteristics. For self-efficacy, job involvement and perception of relevance of the OJT as much as possible existing scales were used. For example, the 6-item scale of Lodahl & Keiner (1965) was used to measure job involvement. Single items were used to measure the following variables: sex, age, experience as a telemarketeer, hours on telephone per week, education, job-related training.

Data collection procedures. With exception of the measurement of the organizational benefits, data was collected with the use of written questionnaires. As indicated above data was collected from trainers, trainees and trainees' managers. The questionnaires for the trainers and the managers focused only on trainees' job behavior. This was also included in trainees' questionnaires, together with the characteristics of the training, the work environment, and trainee's characteristics. The items of the scales were phrased, whenever possible, in statements. The agreements was rated on a 5-point Likert-type scale. For the measurement of trainees' sales behavior items with a 7-point rating scale were used.

The O1- and O2-questionnaires for the trainees were handed out to them by the trainers. The O3-questionnaires were mailed to trainees individually. Each trainee questionnaire contained a letter to explain the aim of the study and to motivate trainees to participate. Trainees' managers were asked to persuade their subordinates to return their questionnaires.

Respondents. In the organization there are 64 regional call-centers. These are divided into two divisions: consumers and business. The latter operates at the market for business enterprises, while the former is dedicated to serve individual customers. Trainees of 7 regional call-centers were involved in this study. With exception of one all were operating within the individual customer segment. At the start of the study there was no information available regarding the total number of trainees within these 7 call-centers.

Results

Due to the limited length of the paper no attention is paid to the data stemming from the questionnaires of trainers and trainees' managers.

Response. During the data-collection phase it turned out that in one of the 7 call-centers the OJT was stopped in a very early phase of the deliverance. From this call-center only 2 trainee's O1-questionnaires were collected. In an other call-center the deliverance already started. From this call-center only O2- and O3-questionnaires were collected. The following number of trainees' questionnaires were received: 49 O1-questionnaires, 39 O2-questionnaires and 37 O3-questionnaires.

Treatment of the non-response. A comparison is made of trainees that mailed one, two or all three requested questionnaires. For this purpose use was made of oneway analysis of variance. Results show that there are no indications that the number of returned questionnaires is linked with characteristics of the trainee, the training or the work environment. Also no link with trainee's sales behavior was discovered. Thus selective non-response did not occurred. In total 36 trainees were included in the data analyzing process. These trainees returned all three or two out of three questionnaires. For the trainees that mailed two of the three questionnaires, the values of the variables stemming from the missing questionnaire were replaced by the variable group mean, or scores were estimated with the use of the average increase between two time intervals. This latter procedure was applied to trainees' sales behavior and job involvement because the performed *t*-tests indicated that the values of these two variables changed over the three time intervals. The estimation of scores was applied to 6 trainees that did not returned the O1-questionnaire, 3 trainees that did not mailed the O2-questionnaire, and 11 trainees where the O3-questionnaire was missing.

Reliabilities of the scales. For the majority of the scales Cronbach's alpha was above .70. For several scales the reliability varied between .60 and .70 which was found acceptable. Reliabilities were computed with the observed scores. Thus estimated scores were excluded from the computation of the relaibilities.

Deliverance of the OJT. Deliverance took place in the last three months of 1995. In some call-centers the OJT deliverance took place in one month, in other call-centers the deliverance was spread over two months. The average duration of the OJT per individual trainee was 4.68 hours. For 8 trainees the OJT the length of the OJT exceeded the five hours. The quality of the deliverance was perceived as high (M=3.96, sd .36, n=32). The modest standard deviation of .36 refers to the fact that trainees agreed upon the high quality of the OJT deliverance.

The effectiveness of the OJT. First attention is paid to trainees' sales behavior scores. Sales behavior was measured with 7-point rating scales. At the start of the OJT trainees' sales behavior scores (M=5.10, sd .69) are slightly below the sales behavior scores at the end of the OJT (M=5.37, sd .67). Thus the OJT resulted in minor positive changes (.27) in trainees' sales behavior. However, the results of the performed *t*-test show this modest progress is statistically significant (t=5.13, df = 32, p .00, one-tailed). Although the average progress is modest an inspection of the individual trainees' sales behavior scores shows that five trainees did not improve their sales behavior but for them the OJT resulted in a decrease in behavior. The largest decrease is -.44. On the other hand some trainees gained a higher increase in behavior. The highest increase in sales behavior is 1.05.

To investigate the transfer of the OJT a comparison of the O2-scores and O3-scores (rated 15 weeks after the completion of the OJT) was carried out. The comparison of the trainees' ratings indicated that no significant change in sales behavior occurred (t=.83, df=33, p .41, two-tailed). Between O2 and O3 the average increase in sales behavior scores was .04. Inspection of the individual trainee transfer scores shows that for 10 respondents there was a negative transfer between O2 and O3. The largest decrease was -.52. For other trainees the increase between O2 and O3 was higher than the mean score of .04. The highest transfer score is .92. In other words there exists some variation in progress and transfer within the respondents group.

Further inspection of the monthly sales of the seven call-centers took place. Information extracted from the management information system was available only for the call centers operating within the individual consumers segment. Because one of the seven call-centers involved in this study operates within the business enterprises segment, 6 call-centers remained. From these six call-centers one was excluded because the OJT was interrupted shortly after the start. Thus from 5 call-centers data regarding the monthly sales was available. The monthly sales of these 5 call-centers were compared with the sales of the other 26 call-centers within the consumers segment where the OJT was not delivered. This group of 26 call-centers served as a control group. Three time intervals were constructed: the three months prior OJT, the month(s) OJT was delivered, and the three months after deliverance of the OJT. Because the moment of deliverance and the duration of the OJT per call-

center varied for each individual call-center these time intervals were constructed. In Table 1 the results of the sales per time interval are displayed.
A comparison of the sales before and after the deliverance of the OJT shows that in 4 of the 5 call-centers a significant increase in sales is established. However, the call-centers in the control group also show in this period a n improved sales performance. Nevertheless, the increase in sales exceed the increase in sales of the call-centers in the control group where no OJT was delivered. For one of the 5 call-centers (named as DHN in Table 1) the comparison of the pre and post sales shows that no increase was realized but that a very modest decrease in sales occurred.

Tabel 1. Monthly sales before, during and after the deliverance of the OJT

Call-center	*average monthly sales (calculated over three months before deliverance OJT)*	*average monthly sales (calculated over the month(s) of deliverance OJT)*	*average monthly sales (calculated over the three months after deliverance OJT)*
call-center ASS	5403 (100%)	6451 (119%)	7592 (141%)
control group (n=26)	10243 (100%)	11308 (110%)	12258 (120%)
call-center DHN	12328 (100%)	12822 (104%)	12257 (99%)
control group (n=26)	10602 (100%)	12391 (117%)	12531 (118%)
call-center ZHZ	5166 (100%)	6942 (134%)	7931 (154%)
control group (n=26)	10243 (100%)	9794 (96%)	12875 (126%)
call-center REP	5733 (100%)	9387 (164%)	11460 (200%)
control group (n=26)	10602 (100%)	11688 (110%)	12875 (121%)
call-center RDN	9286 (100%)	10158 (109%)	12258 (132%)
control group (n=26)	10602 (100%)	12822 (121%)	11941 (113%)

Correlations with progress and transfer. To examine which variables are linked with the progress and transfer of the OJT, two variables were constructed. The first variable 'progress sales behavior', reflects the increase in sales behavior between O1 (start OJT) and O2 (end of OJT). This variable is computed by aftrekken the O2-score of the O1-score for sales behavior. The second variable, namely 'transfer sales behavior', reflects the difference between the O2-score for sales behavior (end of OJT) and the score for sales behavior 15 weeks after the completion of the OJT. Consequently correlations were computed to investigate links between the progress and transfer with characteristics of the trainees, the training and the work environment. First attention is paid to the progress in sales behavior. Due to the limited space only the correlations that are statistically significant are displayed in Table 2.

Table 2. Correlations progress in sales behavior with characteristics of trainee, OJT and work environment [1) 2)]

	experience	*job-related training*	*O1 sales behavior*	*feedback manager*	*support manager*	*length OJT*
progress	.30**	-.33**	-.27*	.33**	.40***	-.38**

1) *** $\alpha < .01$; ** $\alpha < .05$; * $\alpha < .10$

[2] 30 < n < 33: correlations based on all cases with valid values for the two variables being correlated

Table 2 shows that managerial behavior is closely linked with the progress in sales behavior. Managerial support is the variable with the highest correlation coefficient (.40) and there exists also a correlation with managerial feedback. In total three trainee characteristics show samenhang with trainee's sales behavior progress. Job related training, reflecting the number of days trainees received training for their current job prior to the deliverance of the OJT, is correlated negatively with trainee's progress in sales behavior. Also, the trainee's sales behavior at the start of the training shows a negative correlation with trainee's progress in this area. The trainee's experience as a telemarketeer is positively linked with the progress in sales behavior. Remarkably the duration of the OJT is linked negatively with the progress in sales behavior. Thus the longer the trainee received training, the more modest is the trainee's progress in sales behavior. A closer inspection of this correlation took place with the use of the PLOT function in SPSS. Results of this investigations are that an OJT of less than five hours did establish progress in sales behavior. An OJT of five hours or more resulted in a very modest or even in a regression of sales behavior. A duration of five hours of more was reported by 8 trainees.
Consequently correlations were computed with transfer sales behavior to investigate links with characteristics of trainee, training and work environment. In Table 3 only the statistical significant correlations are displayed. As Table 3 shows only moderate correlations exists with the transfer of sales behavior. Two trainee characteristics show a positive connection with trainee's transfer scores: job-related training and the O2-score for trainee's self-efficacy (rated at the completion of the OJT). Workload is negatively correlated with the transfer.

Table 3. Correlations progress in sales behavior with characteristics of trainee, OJT and work environment [1] [2]

	job-related training	*self-efficacy (O2)*	*workload*
transfer	.23*	.36**	-.23*

[1] ** $\alpha < .05$; * $\alpha < .10$
[2] 33 < n < 34: correlations based on all cases with valid values for the two variables being correlated

Multiple Regression analysis. Regression analysis, procedure stepwise, were carried out with the progress scores and transfer scores respectively. The results of the multiple regression with progress as dependent variable are displayed in Table 4. For the trainee's progress in sales behavior three predictors were found: managerial support, trainee's sales behavior at start of OJT, trainee's experience as telemarketeer.

Table 4. Multiple regression with sales progress as dependent variable [1]

	Mult.r	r^2	*p(F)*	*Beta*	*t*	*p(t)*
support manager	.46	.21	.015	.53	3.55	.002
O1 sales behavior	.60	.36	.005	-.38	-2.50	.020
experience	.70	.49	.001	.36	2.43	.023

[1] n = 27

In total these three variables explained 49% of the variance in progress scores. From these three the managerial support functions as the most powerful predictor. 21% of the variance in progress scores is explained by this variable.
As Table 5 shows the multiple regression analysis with transfer as dependent variable resulted in the discovery of one predictor: trainee's self-efficacy at the completion of the OJT (O2-score). This trainee characteristic explains only a limited amount (13%) of the variance in transfer scores.

Tabel 5. Multiple regression with transfer sales behavior as dependent variable [1)]

	Mult.r	r^2	*p(F)*	*Beta*	*t*	*p(t)*
self-efficacy (O2)	.36	.13	.038	.36	2.17	.038

[1)] n = 33

Conclusions and discussion

In this paper two research questions are central. The first questions concerns whether the OJT result in improvement of trainees' sales behavior and increased monthly sales. Indeed the OJT cause an improvement in trainees' sales behavior. Although this improvement is rather modest it is maintained over a long period of time. Further trainees differ in their degree of improvement. For some trainees the OJT results even in a decline of their sales behavior. There are two possible explanations to take into account to explain the limited observed progress in sales behavior. The first one is that these employees already have subtantial experience with their daily tasks. Also they received training for their tasks in the past. Through this experience en prior training they achieved a certain level of performance. Any new training event does not improve their performance significantly, because of the 'ceiling effect'. This occurs expecially when the training event can be characterised as a refreshment training of a rather limited length wich is the case with the OJT in this study. A second explanation might be that trainees overestimated their sales behavior at the start of the OJT, resulting in high scores for sales behavior at the start of the OJT. During the OJT they become aware of the weak spots in their behavior, as a result of the trainer's feedback, and at the completion of the OJT trainees do not perceive a subtantial progress.
Proving whether the OJT cause positive sales results is rather difficult. First because not for all call-centers where training took place figures were available. Second because a change in sales results might also be caused by other variables that were not involved in the data collection (Philips, 1996). Therefore, alternative explanations can not be excluded. Nevertheless this may not be perceived as an escape to avoid drawing conclusions in this area. For four of the five call-centers the monthly sales figures suggest that the increase in sales exceed the increase in sales present in the control group. In one of the five call-centers where deliverance of the OJT took place no increase in sales was reported. A possible explanation for this lack of improvement might be that in this call center the monthly sales were already on a high level before the OJT took place. It is high compared to the other call-centers where the training was delivered but also high compared to the sales of the call-centers within the control group. Possibly in this call-center a 'ceiling effect' is present.
The second research question focuses on the variables that explain the progress and transfer. The findings suggest the contemporary notion that training effectiveness is the result of the interplay between characteristics of the trainee, the training and the work environment (Baldwin & Ford, 1988). The job-related training prior to the OJT and the O1-score for sales behavior are correlated negatively with progress. A possible explanation is that if trainees already received subtantial training for their daily work or they assess their behavior as sufficient at the start of the OJT trainees do need experience the need to improve their behavior. Further it is remarkable that the duration of the OJT is linked negatively with the progress. Perhaps the longer the training the more feedback a trainee

recceives that his behavior is less adequate than assessed at the start of the OJT, resulting in lower behavioral scores at the completion of the OJT compared to the start of the OJT.
The degree of transfer correlates positively with trainee's self-efficacy at the end of the OJT, with previous job-related training, and it correlates negatively with the workload. A possible explanation might be that more training in the past reflects also more experience with applying the training content into daily work. In general only a few variables were linked with the transfer, and only one of these three, self-efficacy, was found to serve as a modest predictor for transfer scores. These findings makes it necessary to rethink the theoretical models used to explain transfer of training.
A troublesome point in this study was the participation of trainees. The selected research design with repeated measures proves to be adequate from a theoretical point of view. However, it is a rather vulnerable design to use in the context of HRD. Therefore, it is necessary to rethink the practical consequences of research designs and to search for research designs that are more applicable in the domain of HRD.

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Finding Their Own Way: Informal Learning and Public School Teachers

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Eighteen teachers were interviewed to examine the informal ways that public school teachers develop professional expertise. Analysis of the data showed that teachers performed three roles during informal learning: knowledge exchanger, environmental scanner, and discoverer. Engagement in these roles was influenced by organizational characteristics such as classroom location, allocation of resources, school policies, evaluation processes, and reward systems. Implications of these findings for facilitating informal learning in the workplace are discussed.

The nature of professional work has changed dramatically in recent years. It involves far greater pressures, more ambiguous and ill-structured problems, and greater uncertainty than ever before (Drucker, 1988). A group of professionals for whom these defining aspects of work especially apply are public school teachers. During the past 20 years the scope and intensity of teachers' jobs have rapidly increased (Hargreaves, 1992). Increasingly, teachers are required to teach more content and subjects to classes containing greater numbers of students with emotional, social, and learning problems, some of which are far more serious in nature than ever before. In addition to teaching responsibilities, the decentralization of decision making in school districts calls for teachers to play an increasingly active role in the management and operation of schools. These changing role expectations have resulted in many new learning needs for teachers.

In large part, school districts rely on formal training and development activities to promote teacher expertise. Districts provide a variety of formal training and development opportunities for teachers, ranging from district-sponsored in-service activities to financial support for professional conferences. The intent of these opportunities is to help teachers develop improved job knowledge and teaching skills, greater understandings of school functions and responsibilities, and greater confidence in their roles as educators.

However, recent studies have shown that professionals learn a great deal through informal experiences in the workplace (Ehly, Retish, & Shokoohi-Yekta, Submitted for publication; Lovin, 1992). The school setting is a teacher's workplace. In this setting teachers informally learn by engaging in such activities as talking and sharing instructional materials with other teachers, reflecting on past experiences, and experimenting with new instructional strategies.

A concern about teachers' reliance on informal learning for developing expertise is that the intensification of their work may constrain their participation in informal learning experiences (Corcoran, 1990). The reality of public school teaching is that most teachers are isolated from their peers for most of the work day and their time is completely committed (Hargreaves, 1992). This leaves little opportunity for informal learning. The impact of increasing work demands on informal learning may be particularly troublesome for novice teachers. The expertise literature has documented that while experts have a wealth of job-related knowledge, experience, and resources, novices, or beginning teachers, possess fairly superficial bodies of knowledge, little relevant experience, and few resources (Gick, 1986). It is possible that, because of these differences, beginning teachers use less effective informal learning approaches (Russell, 1993).

Therefore, if teachers make use of informal learning experiences to develop knowledge about their jobs, their schools, and themselves; and, if the nature of a teacher's job provides little time or opportunity for such learning, then more must be known about the ways in which teachers with varying levels of experience acquire the knowledge they need to succeed in today's public schools. Information such as this could be used to facilitate professionally growth enhancing interactions among teachers and could also be used to reconsider how school districts presently promote the training and development of teachers.

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Research Questions and Methodology

The purpose of this study was to explore the informal ways that public school teachers with varying levels of experience develop professional expertise. Accordingly, the research questions that guided this investigation were: (1) What kinds of knowledge do teachers acquire in the workplace? (2) What sources do teachers use to acquire this knowledge? (3) What methods do teachers use to acquire this knowledge?

Two schools in the Iowa City Community School District (ICCSD) served as the research sites in this study. Iowa City is located in the southeastern region of Iowa and is home to the University of Iowa. The city is a fairly small community of 65,000 residents, most of whom are professional families affiliated with the university. The ICCSD consists of 16 elementary schools, 2 junior high schools, and 2 senior high schools. At the time of the study, the school district enrolled 9,947 students and employed 730 teachers. For the purposes of this study, beginning teachers were defined as those teachers with less than two years of teaching experience, developing teachers had between two to five years of teaching experience, and experienced teachers had more than five years of teaching experience.

The first of two schools participating in this study was a junior high school, which enrolled 766 students in grades 7 and 8 and employed 55 teachers. There were no beginning teachers in this junior high at the time of the study. Nine experienced teachers and two developing teachers participated in this study. Three of the nine experienced teachers were male. Both developing teachers were female. Teacher-participants taught language arts, math, science, physical education, health education, and special education.

The second participating school was a senior high school, which enrolled 1592 students in grades 9 through 12 and employed 90 teachers. Seven teachers from this school participated in the study: two beginning, one developing, and four experienced. All beginning and developing teachers and two of the four experienced teachers were female. Subjects taught by the teacher-participants included math, social studies, and language arts.

Teachers from these two schools were recruited by open invitation from the principal of each school to participate in this study. Eighteen teachers accepted the invitation and were classified as beginning, developing, or experienced teachers. Each teacher participated in a semi-structured, in-depth interview of one to one and one-half hours conducted by one of the two researchers over a six-month period. In addition to the interviews, numerous visits were made to each school to gain a greater understanding of the school setting where teacher-participants worked.

Data analysis comprised three broad phases within a constant comparative framework (Miles & Huberman, 1994). The first phase consisted of building a set of categories that represented the learning experiences of the teachers and the researchers' general conceptual framework regarding informal learning in the workplace. Seventy-four categories were created and organized into 5 independent dimensions: environmental characteristics influencing informal learning, personal characteristics influencing informal learning, learning sources, learning methods, and teacher responsibilities. Additional rounds of reading and coding led to the addition of a sixth dimension (learning potency) and the creation of additional categories. At this point, two teacher-participants reviewed the categorizing framework and codes. Both teachers reported that the framework and codes were consistent with their interpretations of how teachers informally learn in the workplace.

The accuracy and completeness of the coding process was confirmed in the second phase of data analysis. An iterative coding process was used in which the principal investigator coded the data, the research assistant reviewed the accuracy and completeness of the codings and proposed changes and/or additions to the assigned codes, and the principal investigator reviewed and integrated the research assistant's proposed changes into the data.

The third phase of data analysis consisted of inducing themes relevant to the research questions from the coded data. A matrix of the 10 learning methods and 10 learning sources was constructed for each teacher experience level in each school. These matrices were used to accumulate coded segments of text from the transcripts, field notes, and memos. The accumulated

segments of text in each cell of each matrix were then analyzed to induce themes and patterns of meaning within and across schools and within and across teacher experience levels.

Discussion

There is a prevailing perception that schools are places where children learn. But what about the learning needs of those who teach our children? Professional development theorists, such as Smylie (1995), assert that sustained educational improvement will fail unless the emphasis shifts from creating conditions for productive student learning to workplaces where teachers can learn. In order to design such workplaces more must be known about the processes teachers use to learn in these settings. Findings from this study concerning the informal learning processes of teachers, implications of these findings for facilitating teacher learning, and recommendations for future research are presented in this section.

Informal Learning Processes. Teachers learned important types of knowledge by performing three different roles. The first role was knowledge exchanger, in which teachers shared and reflected on others' practice and experiences. The second role was environmental scanner, in which teachers independently scanned and gathered information from sources outside the school. The third role was discoverer, in which teachers actively experimented with new ideas and techniques.

Knowledge Exchanger. The predominant way teachers developed expertise was by sharing and reflecting on others' practice and experiences. Sharing and reflecting occurred when teachers informally talked, observed, shared resources, collaborated and mentored others.

Teachers frequently talked with others to share and reflect on their experiences. According to participating teachers, the most useful people for them to talk with were their peers. One experienced teacher's motivation for participating in this study was to:

> get across...this whole learning thing of how you as a teacher grow and learn...from the wizards in the field...you have to be open to gleaning from those around you...who have been doing it, and that is where you really learn is to let yourself continually be open to growing and learning...from the masters.

Peers provided teachers with information and insights that helped them handle instructional and student problems and concerns, explore innovative instructional strategies and practices, develop technology skills, learn to work with support staff, develop their educational philosophies, and, particularly for beginning and developing teachers, learn about the norms of their work groups and schools. The majority of the participating teachers reported that more experienced peers in the same subject areas or grade levels were the most useful sources for learning job and organizational knowledge.

Teacher talk was often informal and unplanned. Chance encounters during the normal course of the work day, often in such places as the hall corridors or departmental offices, were customary contexts where conversations occurred. Teachers used these encounters, as in the words of one junior high teacher, to "bounce ideas off of someone else in the hall...right when [a problem is] immediate. [That] has made all the difference in the world. I feel like I'm not making all these decisions [by myself] that are very important to these kids."

School duties also provided frequent opportunities for teachers to talk with each other. For example, a requirement at the junior and senior high schools was that teachers had to be in the halls during class switching times. Teachers reported that they frequently exchanged useful information about lessons and students with other teachers during such times. Teachers whose classrooms were not in close proximity to peers expressed frustration in not being able to interact with their colleagues during these times.

In addition to peers, teachers reported that they regularly talked with administrators and students to learn useful information. They talked with administrators to obtain ideas for handling problem parents and student discipline issues, information about technology, and suggestions for improving their teaching. Beginning and developing teachers were found to access administrators for assistance much more than their more experienced counterparts. All teachers reported that

they often talked with students to gain a different perspective on the content of lessons, develop a greater understanding of students' instructional problems, and foster student rapport. A high school teacher described the contributions that students made to his learning in this way:

> I know every single day that I come to school I learn something new. I had a kid ask me the other day, "When you talk about a war innocent women and children get killed. What about the innocent men?" Now, in eight years nobody's ever asked me about innocent men. And I'd never thought of it myself. So that kid gave me an entirely new perspective from that, and it's great. So, I learn from them all the time, just like they learn from me.

While all teachers relied on peers, administrators, and students for information, experienced teachers used a much greater variety of sources than less experienced teachers did. Experienced teachers indicated that when they needed to learn something they "feel comfortable asking everyone on the staff," from librarians to guidance counselors. In addition, these teachers frequently consulted with parents, especially those with special needs children, and educational professionals outside the school, such as community service providers and educational specialists.

A second method that teachers used to share and reflect on others' practice and experiences was observation. According to participating teachers, observing others' teach is an excellent method for developing their teaching and classroom management skills. However, teachers reported that school schedules and policies often inhibited them from conducting observations. Several teachers reported that they "stand outside doors of some of the good teachers during free periods" to informally observe the classes of their colleagues. The easiest and most useful means of observing others was found in those situations where teachers shared classrooms or teaching responsibilities.

Resource sharing was a third method that teachers used to share and reflect on others' practice and experiences. A prevalent norm of teachers in the same subject areas and grade levels was to "share materials like crazy and not worry about the other person doing exactly the same thing." Unlike other professions, teachers did not appear to have a high level of proprietary concern about sharing or adapting others' instructional content and materials.

A fourth method that teachers used to share and reflect on others' practice and experiences was collaboration. Collaboration was frequently reported by teachers as a way of pooling expertise among groups of people to collectively address issues that, if left to one individual, would not result in as high a quality an outcome. Common forms of collaboration included: special education work groups, which focused on ways of dealing with the increasing demands of special education programs; building vertical teams, which made decisions concerning the management of their schools; study groups, which studied instructional topics such as innovative learning theory and instructional strategies; and curriculum development work groups, which reviewed and improved school curricula. In addition to accomplishing the intended purposes of these activities, collaborations often resulted in unintended learning outcomes, such as the equitable distribution of work among teachers in work units, unexpectedly creative ideas, increased horizontal communication among teachers at different schools, and improved teamwork skills. Experienced teachers reported far more involvement in collaborative activities than did beginning and developing teachers.

Mentoring was a fifth method in which teachers engaged to share and reflect on other's practice and experiences. Teachers reported that informally observing, being observed by, and talking with their mentors helped them develop their teaching and classroom management skills, as well as acclimate into the school culture. Experienced teachers reported that another form of mentoring, supervising student teachers, was beneficial to their development. In the words of a junior high math teacher, this type of mentoring experience provided him with the opportunity to "examine what and how I teach the way I do...It opens my mind to new ideas and ways of doing things."

Environmental Scanner. In addition to exchanging knowledge with others, teachers independently scanned and gathered information from outside sources.

Memberships in professional organizations were one way in which teachers scanned for information. Such memberships provided teachers with opportunities to scan journals and other

publications to learn about recent developments and research in their content area and in learning and instruction. In addition to published materials, memberships provided teachers with opportunities to attend state and national meetings, through which they met, talked with, and developed networks of colleagues.

In addition to professional organization memberships, many teachers reported that they attended educational conferences and workshops in hopes of finding instructional materials and ideas. As a junior high math teacher emphatically stated, "a good teacher is one that knows how to steal. I was at a conference and someone did a presentation using [a geometric software program]. I saw that (snaps fingers), took their ideas, took their lesson plans, everything, and just incorporated it into my own classroom." In addition, teachers reported that they attended conferences and workshops to interact with and develop a network of colleagues.

The Internet was another source of information that teachers scanned. All teachers in this school district have computers in their classrooms, which are hooked up to a district-wide server and the Internet. Participants reported that they were increasingly scanning the Internet for instructional content and materials.

Teachers also scanned for information while engaging in everyday activities outside of the school context. Teachers reported that they were always open and ready to accept any new information that might prove useful to their teaching. An experienced senior high teacher captured the essence of everyday scanning activities when she reported:

> I am always looking...if I meet someone...in a social situation and they say..."I do this," I say, "Hey, great. Tell me a little bit about your job, about the stuff you do, how does it work?" And so I'm constantly learning about this stuff I know I'm going to be teaching about.

Ease of access influenced teachers' decisions to scan a particular source. For example, many teachers reported that funding for professional conferences and workshops played a key role in their decision to attend. Likewise, teachers reported that they were more likely to use the Internet now that they had computers in their classrooms.

Discoverer. Independent experimentation was a third way in which teachers developed expertise. Teachers routinely acted, reflected on their actions, and then either took immediate actions to alter their practice or recorded their future plans to do so. An experienced junior high teacher articulated the integral relationship between reflection and action in this way:

> If something doesn't go right I first look at what I've done and evaluate what I'm doing...my first inclination if a bunch of kids fail my test is that I didn't do a good job teaching, and what can I do to do that better, and how can I re-do that?

Unexpected events catalyzed teachers' reflections. Experiences in which teachers' planned strategies and practice produced surprising or unanticipated outcomes caused disruption in their routines. Faced with such disruptions teachers were impelled to reflect upon gaps between what actually happened and what they expected would happen.

Another feature of teachers' reflections was its solitary nature. In most cases teachers reflected independently. In addition to reflecting on their own, many beginning and developing teachers reported using student reactions as the sole source of information for their reflections. Sole reliance on learner reactions can present a skewed picture of what actually happens during or as a result of instruction, yet these teachers seemed completely unaware of such dangers.

Rarely did reflections in the midst of action cause teachers to divert from their planned course of action. The types of situations where reflections resulted in immediate changes to planned courses of action were somewhat surprising. In classroom management situations less experienced teachers frequently attempted to handle behavioral problems and found that their strategies for dealing with the problems were not working. As the behavioral problems escalated, these teachers tried to determine why the strategies were not working and choose a more appropriate one to regain control of the situation. Other situations where teachers routinely reflected-in-action involved learning new computer skills. In contrast to classroom management situations, the risk involved with making mistakes when learning computer skills was perceived by teachers as quite low and, as a consequence, they took great liberty in experimenting and adapting their behaviors as they "played around with the computer."

In summary, three roles describe the ways in which teachers informally learned new knowledge. As knowledge exchangers, they shared and reflected on others' practice and experiences by talking, observing, resource sharing, collaborating, and mentoring. As environmental scanners, they independently scanned and gathered information from sources outside the school and, as discoverers, they used their reflections as the basis for experimenting with new ideas and techniques.

Implications. Many recent attempts to facilitate teacher learning have failed to effect desired outcomes (Darling-Hammond, 1996; Sykes, 1996). In general, these attempts involved fragmented efforts to improve teacher skills or environmental conditions for learning, but did not systemically align the developmental needs of teachers with existing aspects of the teachers' work environment.

One important finding in this study was the serendipitous nature by which teachers learned from each other. Serendipity embraces the notion that people use their intuition and tacit knowledge to fortuitously place themselves in advantageous situations where learning may occur (Robinson & Stern, 1997). In this study, participating teachers intuitively sensed where they should be and whom they should be around to increase the likelihood that they would learn information of importance. The serendipitous nature of informal learning calls attention to the important role of a community of practice in teacher learning. More experienced teachers had expansive networks, which included teachers across the district, state, and country. However, other teachers' networks were limited to those they knew within the school building and, for some less experienced teachers, were limited to those they knew within their own department. Clearly, opportunities for serendipitous learning increased as a teacher's network of colleagues expanded.

The majority of teachers in this study reported that two forms of organizational support facilitated teacher interaction and networking. First, departmental offices provided places where teachers informally met, talked, and shared ideas. Unfortunately, beginning teachers had the most difficulty using these facilities throughout the day because their classrooms were often located farthest from the offices. Second, mentoring was reported by many teachers as an integral part of their professional development. A commonality of many of these reports was the fortuitous way in which these mentoring relationships evolved. Oftentimes, the sharing of a classroom or a planning period provided teachers with opportunities to form mentoring relationships with more experienced teachers. Teachers used these relationships to work through the messy problems and persistent dilemmas commonly found in professional practice (Schön, 1987). While these two forms of organizational support have potential for facilitating teacher interaction, the reality is that teachers are often inhibited from taking advantage of them because they lack the physical proximity and time to do so.

Three recommendations are proposed for facilitating teacher interaction. First, care needs to be given to classroom assignments. Classrooms need to be strategically assigned so that teachers, especially those in their early stages of development, are located near peers in the same subject area or grade level. A cross-national study of teacher induction practices, reported by the U.S. Department of Education (1997), found that in other industrialized countries, such as Japan and Australia, school systems strategically place novice teachers next to more experienced teachers in the same grade level or subject area to maximize teacher interaction and sharing. In contrast, United States school systems isolate teachers from other teachers and provide them with little feedback or help. American school systems need to reassess the value of conventional practice that bases classroom assignments on factors such as seniority and, instead, strategically assign classrooms so that teachers in the same subject areas or grade levels are located near each other.

A second recommendation for facilitating teacher interaction is the development of district-wide electronic listserves for teachers who teach in the same subject areas and grade levels. In a sense, these listserves would serve as *virtual hallways*, where teachers could interact without being constrained by lack of physical proximity to each other.

A third recommendation for facilitating teacher interaction is to schedule common student-free times for teachers in the same grade levels or subject areas. Traditionally, the need for shared planning time has not been taken into account when developing school and teacher

schedules (Little, 1990). As a consequence, teachers have been left on their own to search out other teachers when they have a need to learn. The end result is that when teachers need help they go to an available, rather than the most knowledgeable, teacher. In a few notable instances in the participating schools, schedules had been intentionally designed so that certain teachers shared common planning periods. These teachers reported that this arrangement increased the frequency and quality of their interactions and collaborations.

In addition to facilitating teacher interaction, necessary resources for teacher learning must be allocated. Unquestionably, the resource that teachers reported they need more of than any other is time. A survey conducted by the National Education Association (1987) found that secondary teachers have 13 minutes of preparation time for each hour of instructional time. In conventional instructional design contexts this ratio is reversed with a rule of thumb of three hours of design time for each hour of instructional time. Teachers' unencumbered time continues to dwindle with the increasing demands of new instructional assignments and inclusion of special needs students in general education classrooms (Hargreaves, 1992). Teachers cope with the intensification of their jobs by spending less time interacting with peers and thinking independently. In all likelihood, these responses limit their participation in the very types of informal learning activities upon which they depend for their own development--knowledge exchanging, independent scanning, and experimentation.

In addition to time, financial support for scanning activities is necessary for fostering teacher learning. Historically, funds for professional organization memberships and conferences have been viewed as employee perks. However, the findings in this study suggest that teachers depend on these types of activities for interacting with other teachers and developing their professional knowledge. As such, there is a need to reframe our perception of such expenditures as fringe benefits, and view them as necessary for teacher development.

A third resource that is necessary for fostering teacher learning is computer technology. Increasingly, teachers are expected to use computers for administrative tasks as well as to integrate computer technology into instruction. Teachers reported that they have had to push themselves "into learning how to do all this stuff, and there are still some [teachers] that don't know how to open up their e-mail." School districts must ensure that teachers have the necessary skills to use and can conveniently access such technologies.

By themselves the aforementioned recommendations will not be sufficient for fostering teacher learning. Formal school policies, evaluation processes, and reward systems must be altered to reduce the constraints they place on teacher learning.

Formal policies in the schools in this study did not permit teachers to cover the classes of colleagues who wanted, or needed, to observe the classroom techniques of fellow teachers. As one teacher reported, in order to observe another teacher she had to request that a substitute teacher oversee her classes. Not only does this policy prohibit teachers from conducting professional development observations, but it also places an unnecessary financial burden on the school district. Obviously, an appropriate policy needs to be developed.

The data also suggest that more rigor needs to be put into the teacher evaluation process. To be blunt, most experienced teachers in this study thought that the evaluation process was a sham. According to these teachers, administrators were in their classrooms too infrequently to obtain a realistic picture of their teaching performance. Furthermore, since administrators prearranged observation times with teachers, administrators observed teachers' classrooms and performance under exceptional, rather than normal, conditions. And lastly, many teachers reported that post-observation sessions were replete with positive feedback, yet lacked constructive advice. Critical feedback is necessary for spurring teachers' reflections about their classroom practice. Unquestionably, evaluation practices must change so that they involve frequent and unplanned classroom observations. Furthermore, evaluators need to be professionally trained and competent in evaluation techniques so they are able to provide teachers with both positive and constructive feedback.

Reward systems also need to be reconsidered in relation to their effect on teacher learning. Experienced teachers reported that they are increasingly removing themselves from school activities they consider ancillary to their main teaching duties, such as involvement with

co-curricular activities, child study teams, school management committees, and student teaching supervision. These types of activities are an important way in which the expertise of experienced teachers is diffused throughout the school system. However, with the intensification of their jobs, increasing demands being placed on their time, and lack of meaningful rewards for participation in non-teaching activities, experienced teachers were clearly choosing to discontinue their involvement in such activities. Reward systems need to be revised so they provide, particularly experienced, teachers with meaningful incentives for participation in non-teaching activities.

Future Research. Few empirical studies have examined the relationship between teacher learning and performance. Additional research investigating relationships between each of the learning roles identified in this study and teaching performance needs to be conducted. Furthermore, while the literature supports assertions that the types of changes proposed in this paper will positively influence teacher learning and development (for example, see Darling-Hammond, 1996; Ponticell, 1995; Showers & Joyce, 1996), few studies have examined their empirical validity. Investigations of these assertions are needed to develop greater understanding of the potential that these changes have for facilitating the professional development of teachers.

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Learning from Experience: The Professional Practical Knowledge of Female Leaders in HRD

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This case study research explored the workplace experiences of three female HRD professionals to investigate their development and use of practical knowledge. Findings indicated that each leader's practical knowledge was structurally composed of three dimensions which had been developed into a coherent system, integrated in such a way as to generate consistent professional practice. Implications are directed toward the redesign of continuing professional education, and toward frurther research into the systems nature of the structure of practical knowledge.

Summary of the Problem

"We have seen the leaders and they are us."
-Ellen E. Chaffe, presidential address delivered to the
Association for the Study of Higher Education, November 3, 1989

During the past three decades, the emerging notion of shared-power has challenged traditional assumptions about the meaning of leadership, organizational design, and the gender-stereotyping of leaders. The fundamental shift away from a conceptualization of power as domination and control over others toward power as a resource to be shared *with* others has been demonstrated politically and socially in numerous ways in this society. One practice demonstration of this shift has been the development of continuing education programs designed to provide leadership training for the enhancement of the career mobility and promotability of those females seeking to share the traditionally male-held power and responsibility in HRD in various organizations. Since the mid-1980's, these formal programs, usually designed as workshops and conferences, have offered presentations about management, legal issues, fiscal responsibility, political processes, and personal power, offering unique opportunities for the development of networks and selected skills and behaviors. But, in their design, most programs have represented the traditional information-transmission instructional design which is grounded in the technical paradigmatic assumptions criticized by Schön (1987) as fallacies foundational to "the crisis of confidence in professional knowledge" (p. 3). While their content has been highly appreciated by participants, the programs' processes have failed to reflect the reality that most professional learning occurs informally in the workplace (Carnevale, 1984: Watkins & Marsick, 1993). This recognition of the context of everyday practice as a crucible for professional development has prompted studies by policy and accrediting groups resulting in demands for reform and the redesign of professional training programs, and has also been the impetus for Cervaro's (1992) call for a new model of continuing professional education-- one more reflective of the reality of professional learning. Such entreaties suggest that leadership programs for women in HRD may be more effective learning vehicles if the program design is able to correlate the content with workplace experiences. But such a design would require an understanding of the ways in which workplace experiences contribute to the development of professional knowledge, as well as an understanding of the very nature of that knowledge as it is held and used in professional practice. The study reported in this paper addressed the need for the development of such an understanding.

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Critique of the Literature

This study was grounded in Marsick and Watkins' (1990) notion of informal workplace learning. The development of an approach to the study evolved from an exploration of four potentially rich streams of theoretical inquiry: the nature of professional knowledge, practical knowledge, professional experiences, and experience-based learning.

In 1989, Fellenz and Conti noted as a trend a shift from an emphasis on adult education to an emphasis on adult learning. Within the leadership literature, that trend was evidenced in the empirical research studies by a move away from the prevalent end-product (or what-a-leader-is-like) orientation criticized by McCauley (1986), and toward means-oriented inquiry which attempted to develop an understanding of *how* leaders engaged in real-life learning (McCall, Lombardo & Morrison, 1988; Morrison, White & VanVelsor, 1992). These more process-oriented conceptual approaches honored the emerging notions of the nature of professional knowledge which were so perceptibly presented by Schön in 1987. Schön addressed the "crisis of confidence in professional knowledge" (p. 3) by characterizing the real world of practice as a context where practical knowledge develops in the "swamp" of an unstable, conflict-ridden environment where ambiguity and competing value systems create the challenge of subjective decision-making (Cervaro, 1989). Schön's argument about the disparity between the inadequate normative professional curriculum (espousing universal models of practice falsely based in the technical epistemological paradigm) and the reality of professional practice contexts cast attention upon the constructivist paradigm and the epistemological position of the practical.

As a system of beliefs about knowledge, the practical viewpoint considers that professional knowledge is very context dependent in its application, and that professionals are "practical theorists" (Brookfield, 1986) who make decisions based upon wisdom and competence (Houle, 1972) in ambiguous circumstances. Benner (1982) explains that professional expertise is developed through the integration of abstract knowledge into one's repertoire of practice knowledge, where theories are challenged and where preconceived notions are refined with nuance, subtlety, and shades of difference. Practical knowledge, which is "know-how" composed of personal and explicit knowledge, has been embraced by researchers concerned about the ways such knowledge becomes developed through professional work (Benner, 1984; Clandinin and Connelly, 1987; Elbaz, 1981). Because those researchers present practical knowledge as having content and structure as well as those aspects of knowledge that arise out of bodily experience, and because the associated research employs combinations of cognitive and affective approaches such as the documentation of practical actions and biographical history, experience-based learning has come to be employed as a central construct of research in practical knowledge.

The notion of learning from experience has a long and deep tradition in the literature extending back to Aristotle. Although often identified with the progressive movement in this country through the theory-building of John Dewey and Eduard Lindeman, as a central philosophical idea in education it arises from a very complex literature with no established holistic model of how we learn from experience. Dirkx and Lavin (1991) have suggested several ways in which the heterogeneous blend of perspectives can be organized, alternately focusing upon the individual learner or the learners' socio-political context, or focusing upon the experience-based learning processes themselves.

The confluence of these four areas of literature-- professional knowledge, practical knowledge, professional experience, and experience-based learning-- directly reinforces the importance of Cervaro's (1992) recommendation that research supporting the development of a new model of continuing professional education be focused on both "the development of practical knowledge" and "the processes by which professionals use their practical knowledge in their practice contexts" (p. 98); but the literature has not evidenced a connection between practical knowledge and experience-based learning sufficient to inform the creation of such a model.

Purpose of the Study

Toward that end, this study set about illuminating the very nature of practical knowledge by investigating how female HRD leaders had developed that knowledge through their professional experiences and how they used it in practice. Grounded in a constructivist epistemology by the very nature of its central construct, the study specifically sought to identify the representation of that knowledge through a conceptual framework of the structural components of practical knowledge. The framework, originally developed by Elbaz (1981), was operationalized in this study according to the following definitions: Rule is a declaration of what to do or how to do it in a practice situation. Principle is a broader statement which embodies the practitioner's purpose in a

deliberate and reflective way. Image is a meta-level organizer, a metaphoric statement guiding the intuitive realization of purpose.

Method

Continuously from 1985 to 1997, a state-wide leadership program has been offered as a collaborative effort between the Department of Education and the University of Nebraska-Lincoln. Supported with federal sex-equity vocational funding, this program has each year invited a nominated cohort of approximately 25 women to participate in the program. Three purposefully-selected participants were investigated in this qualitative study. They had participated in the program during one year between 1986 and 1990, currently held leadership positions, and, similar to the women in Astin and Leland's (1991) research, represented positional as well as non-positional leaders. The study's phenomenological approach (van Manen, 1990) utilized a case study design guided by Yin's (1989) process model. A series of in-depth structured and semi-structured interviews included a critical incident interview in the form of a Behavioral Event Interview (Finch, Gregson, & Faulkner, 1991), a narrative life-history, and an administered descriptive questionnaire interview designed to gather demographic data along with career-related factors and behaviors. All interviews were audio-taped and transcribed verbatim. Each Leader was treated as a separate case, and cross-case analyses were supported by Yin's pattern-matching logic to strengthen internal validity. Throughout data analysis, *all* of the data sources were reviewed repeatedly in a series of iterations (Huberman & Miles, 1994), a process which developed the findings in consistently more illuminated ways, creating a circle of understanding. Maxwell's (1996) analytical strategies of categorizing, contextualizing, and memoing were employed; and while triangulation and member-checks were used to support internal validity, external validity was assured through analytic generalization (Yin, 1989) and the use of rich, textured descriptions (Merriam, 1991).

Data analysis was conducted in two phases. Phase I consisted of three iterations. During the first iteration, the context of the study was established by the development of individual narrative profiles which both provided the biographical backgrounds for the subsequent event accounts and functioned to provide protection for practical knowledge as the focus of the inquiry. The second iteration focused upon the three Leaders' individual narrative accounts of critical professional incidents which were analyzed for evidence of their inherent structure of practical knowledge. Individual graphic summary analyses demonstrating each of the three structural areas of practical knowledge were organized along a thought-action continuum and were combined in the third iteration to facilitate a cross-case analysis of the findings across the structural areas of Rule, Principle, and Image. It was this process which demonstrated replicated patterns of consistency sufficient to generate a theoretical model of the Leaders' practical knowledge. As an outcome of the analytical process, this was critical, for case studies do not generalize to populations, only to theoretical constructs. It is for this reason that three cases is an adequate a number to provide reliable findings.

In Phase II, all of the data were analyzed for representations of the four processes of experience-based learning-- trial and error, problem solving, creating, and discerning-- as delineated by Dirkx and Lavin (1991). Then, findings from the three categories of practical knowledge developed in Phase I were considered for their relationship to or representation in those process categories of experience-based learning, and a model of those categories was developed.

Findings and Conclusions

This inquiry developed case studies about three HRD leaders, between 40 and 50 years of age, all holding masters or doctoral degrees. Since participating in the leadership program, all three have progressed into positions with greater breadth of responsibility and influence. Alison is a university professor of Business and HRD whose stories focused around her decision-making in choosing to relinquish a high-level administrative position in favor of a faculty role, and her continuing pursuit of "balance" within her sphere of work and her own professional development. Betty is a researcher and HRD curriculum development specialist with a unit providing state-wide staff-development for practitioners involved in legal and case-management services for the Department of Human Services. Her practical knowledge was expressed through stories of her professional socialization as she facilitated a difficult community agency-integration project. Carol is a director with the state educational oversight

agency and has responsibility for the development of personnel as well as compliance in numerous federally-funded education and job-training programs for women. She told stories about workplace events in which she developed a personal understanding of powerlessness and marginalization and the impact of the associated meaning-making upon her professional purpose.

The cross-case contextual findings indicated strong similarity in the descriptive patterns of the environmental factors perceived as affecting their assumption of leadership roles, and indicated that all three women have employed similar strategies to strengthen their career potential.

The participants in this study all explain their learnings or lessons as related, or as falling into thematic categories which, when considered in a holistic way, help them to make sense or understand in a new or different way. They stress that they ponder and think about this relatedness, and purposively apply their knowledge in the decisions and actions of their daily work. Although their life histories and work experiences are distinctly unique, results of the cross-case analysis indicated that their holistic knowledge demonstrates a common internal structure. All three Leaders expressed their practical knowledge in terms of the following dimensions:

(1) singular, metaphorical Images which serve as meta-organizers for their knowledge. The Images are stable. They are open to change through new experiences, but only in the development of depth and complexity. For example, one Leader speaks of now being able to "see" her image in both upright and inverted positions, suggesting two opposing yet complimentary dimensions of her knowledge. Leaders select their metaphors from the world around them, finding an affinity with those that resonate with their purpose. For example, in the preface to their 1993 book (p. xiv), Watkins and Marsick discuss how their resonance with the process of the works of the sculptor Elisabet Ney came to be represented in the title of that book.

(2) a set of Principles which express an internally consistent and coherent sense of purpose, representing the way they both construe themselves as professionals and assert their professional commitment. For example, one leader creates a circular logic with Principles that first involve her dedication to her own learning in order to better effect the learning of others, and then her inability to "make" anyone but herself learn, leading her back to responsibility for her own learning and development. The internal consistency functions to monitor the ethic and continuing integrity of purpose.

(3) a set of Rules which guide the actualization of their purpose. The Rules are both behavioral and existential in their action orientation. For example, one leader who expressed her overall purpose as, "getting women prepared and welcomed into the workplace as colleagues and equals," expressed her rules as determination to always both battle strategically (pick her fights carefully) and be proactive, i.e. vigilant in watching for opportunities to fight ("to help other people to come along, to educate them," thereby advocating for the learners and the trainers in the programs for which she has responsibility).

It was concluded that, through their experience-based learning processes, the leaders in this study had developed these dimensions into holistic systems of practical knowledge which were integrated in such a way as to enable them to generate the consistent practice which supported their professional success. These systems were expressed as stable yet evolutionary in their openness to the development of increasingly encompassing levels of meaning, suggesting that practical knowledge is not fixed, but something one holds in active relation to practice and uses to shape one's work. The alignment of those system's structural dimensions along a thought-action continuum support the critical continuous interplay of the inner-outer, or intuitive-reflective processes of leadership. A conceptual model of the structure of practical knowledge, developed upon the cross-case analysis of the three leaders, is illustrated in Figure 1.

From the analysis of the interview data in relation to the theories of learning from experience it was concluded that the Leaders have developed their practical knowledge by engaging in all of the four categories into which the theories had been sorted. In their critical incident stories the Leaders demonstrated that in a given situation, theories from several categories were represented as being used in combination. For example, a trial and error process might be followed immediately by a problem-solving process and might find expression in a creative communication or even an artistic response as a vehicle for self-understanding.

The findings suggest that the theories of experience-based learning inform an understanding of practical knowledge in two ways. As a phenomenon, the theories illuminate the learning processes through which the practical knowledge is developed and refer to the fact that learning takes place within the crucible of our life experiences and cannot be separated from them. As a concept, experience-based learning provides a means of developing a theoretical understanding of how lived experiences influence what is learned and vice-versa. This practical knowledge is held and used as an integrated system of purpose based on an individual's thought/action relationships.

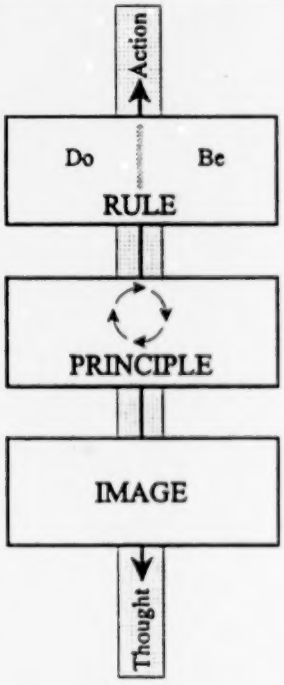

Figure 1. A conceptual model of the structure of practical knowledge as it is held and used by selected female HRD leaders in Nebraska.

Implications for Practice and Research

Implications for Practice

As a demonstration of the structural relationship of the dimensions of practical knowledge, these findings form a theoretical model of practical knowledge which may serve, as vanManen (1990) favors, not to stand before practice in order to inform it, but rather to enlighten practice. The acknowledged importance and relevance of practical knowledge has been based largely on assumptions and on its association with experience-based learning. However, there has been little empirical research to clarify its nature or identify the means of its development in concert with more formal means of learning. The multiple calls for research to guide reform and the transformation of professional leadership development in education have included the recommendation that such practice be built upon practical knowledge and upon gender-inclusive theory, and that such theory be based in empirical data, specifically the documentation of experiences. The findings of this study contribute to such theory development and extend the notions about experience-based learning processes (Dirkx & Lavin, 1991) to their eventual outcomes by providing a map of the territory toward which one's workplace experiences and developmental experiences lead, and it is this theoretical relationship which holds the greatest promise for continuation of the research.

This model of practical knowledge contributes but one more piece to the mosaic of understanding about leadership. Basing their new work in Kegan's (1982) notion of meaning-making, Palus and Drath (1995) have posed the question, "How do individuals and systems evolve the capacity to make more encompassing, adaptive, and sufficiently complex meaning?" (p.13). The model of practical knowledge which emerged from this study contributes to their work by providing a demonstration of that capacity as it is held and used as a social meaning-making process within the socio-political context of the workplace. "...The argument in support of such an offering consists not of defending the truth of the scheme but rather of arguing for its efficacy in understanding leadership as a concept and phenomenon" (Drath and Palus, 1994, p. 5).

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Through this understanding, the planners of leadership programs may engage in more effective practice. The adoption of problem-based learning and other reconfigurations of curricular design have done much to embed life experience into the critical content of professional training programs, and the notion of professional practical knowledge as a structure which represents the "knowing" which is recognized as expertise can only extend these approaches to more comprehensive applications in program design and in the building of learning into the fabric of everyday work experiences.

The results of this study could help provide HRD professionals with tools to, as Senge (1990) recommends, help work itself "become more 'learningful'" (p. 4). In learning how to assess and identify their own practical knowledge, leaders could develop a critically valuable vehicle to help them self-manage their professional development, as McLagen (1983) has urged. By becoming more aware of their own systems of practical knowledge, they could more knowingly monitor the integrity of their beliefs and cognitive processes as thought, and their existential orientations and performance as action. This would support the generation of consistent practice behavior, similar to that discerned in the three leaders in this study.

Implications for research

Iimplications of the findings and conclusions presented in this paper suggest a need for:

1.) a more extensive exploration of the relationship between the structure of practical knowledge and the processes of learning from experience. The use of the shared thought-action continuums of these frameworks as a guiding construct could help illuminate the critical connections between knowing and successfully performing, and

2.) a more developed illustration of the systems nature of the structure of practical knowledge which could provide greater insight into the optimization of selected experiential learning processes within holistic developmental schemes.

The responsibility to continue the work of this research is compelling, for we have seen the leaders and, indeed, they are us.

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